

ITS SAT TIME!

An Introduction to the World of Domestic Satellite Reception

Input by

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To All New-Age Electronic Customers


Electronic Components Ltd., acknowledged leaders in the field of Component supply to the industry, would like to introduce you to our range of Satellite related equipment.

In the following pages you will see details and answers to some of the more commonly asked questions about this exciting new field of communication. Please study these at your leisure and direct any further enquiries you may have to our experienced consultants who will be happy to assist you.

We look forward to the opportunity to provide you with excellent product fully backed by equally excellent E.C.L. Service.

Yours Sincerely,

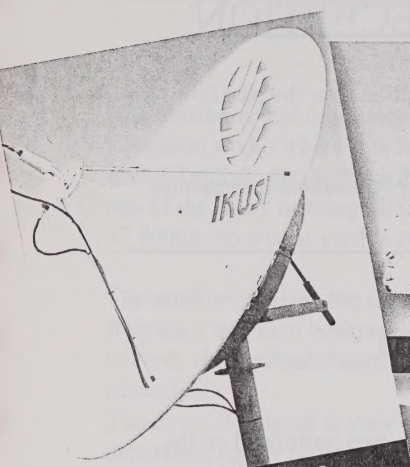
Graeme Manson
General Manager



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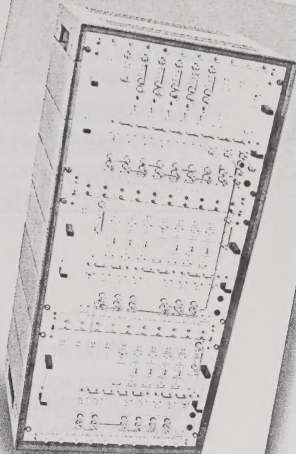
IKUSI-GOOD RECEPTION GUARANTEED



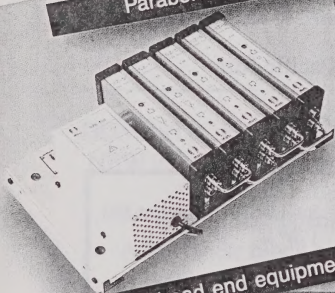
Parabolic antennas



CATV amplifiers



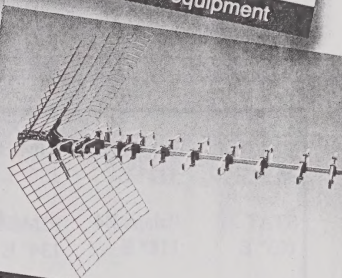
CATV head end equipment



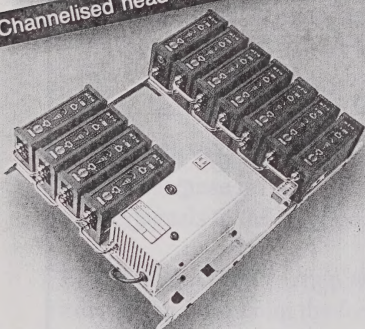
Channelised head end equipment



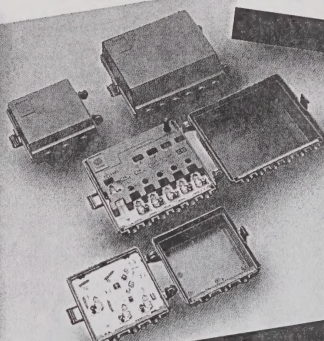
Multiband amplifiers



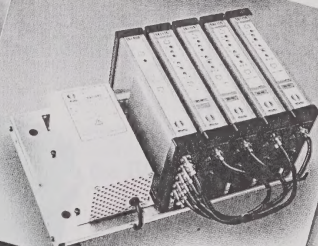
Aerials



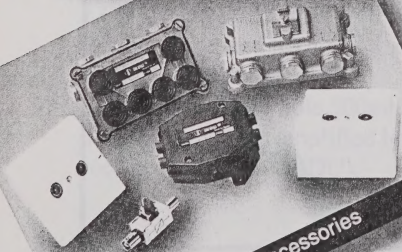
Channelised head end equipment



Mast head amplifiers



SMATV equipment



Network accessories

IKUSI-The best solutions for
domestic, MATV, CATV, and
SMATV systems.



IKUSI

SATELLITE TELEVISION RECEPTION

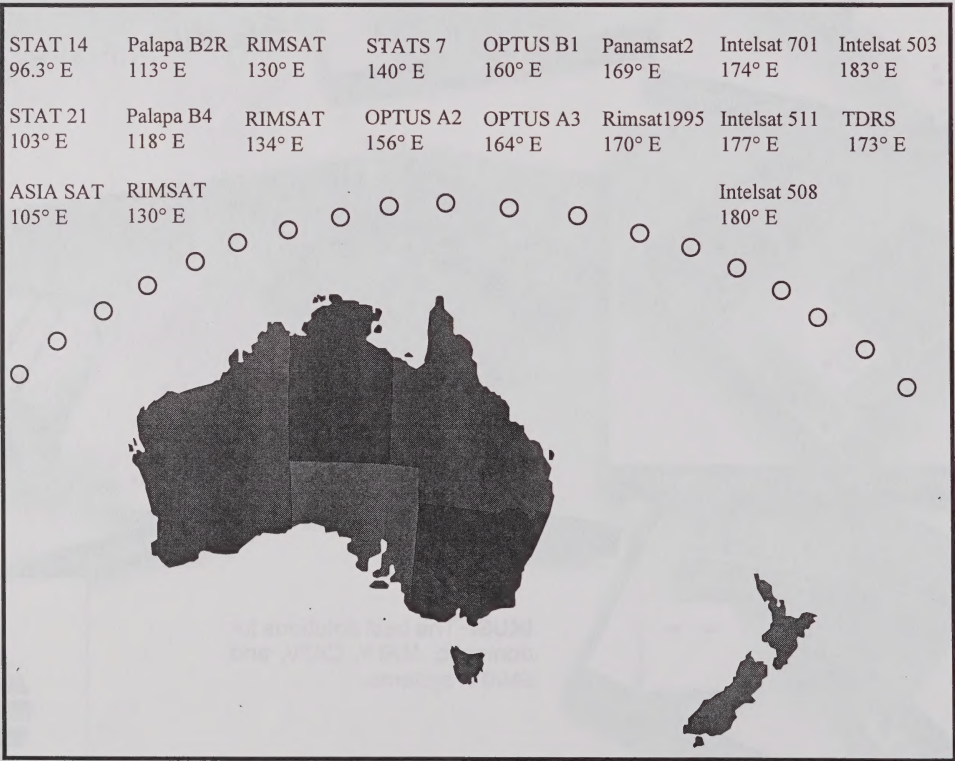
Much has been said and written about satellite television reception over the past few years.
What does this entail, what is the cost, what will I see?
We will attempt to answer these questions and others, and supply practical information on the subject.

THE CLARKE ORBIT BELT

(From 100° W to 100° E)

From New Zealand's location of 174° E many satellites can be seen positioned on the Clarke Orbit Belt. Generally, any satellite within 70° + or - from New Zealand's latitude of 174° E can be seen.

At present some 20 space craft serve the Nations that make up the Pacific Rim.
(see drawing below)



SATELLITE TELEVISION

HOW IT WORKS

A television signal originates from a television studio where it is fed to an earth station (uplink) that uplinks the signal to one of the many orbiting satellites 37,800km above the earth's surface.

The satellite receives the signal at one frequency and then beams the signal back to earth via a suitable beam called the (downlink)

The downlink signal is very weak, depending on the beam pattern and power used. The reception earth station can vary in size from 50cm to 30m.

The downlink beam pattern made on the earth's surface is called a footprint. These footprints can range in size to cover one country or state, or span oceans to link up many countries simultaneously.

Depending on the location within the footprint, the earth stations requirements differ, however all earth stations require the following equipment.

DOMESTIC PURPOSES INTELSAT EARTH STATION DESIGNED FOR NEW ZEALAND C BAND

1. A suitably sized parabolic dish antennae 3m - 3.7m Min.
2. A low noise block converter LNB (25° - 20°k)
3. A feedhorn assembly (Chapparral Polarotor II with teflon slab).
4. A suitable Satellite receiver
5. A Chroma converter with vidiplex decoder

DISH ANTENNAE

The dish antennae is made of reflective materials which gather and focus the incoming Satellite signals to the focal point.

FEEDHORN (With teflon wafer or slab)

Sitting at the focal point the feed horn collects and passes the incoming signals to the Block Converter.

LOW NOISE BLOCK CONVERTER

Bolted to the feed horn the block converter accepts the incoming 3.7ghz - 4.2ghz microwave signals and converts them to a block of frequencies lower (950mhz - 1450mhz) which encompasses the whole 500mhz satellite down link.

This signal is then amplified before its trip from the outdoor unit (ODU) to the satellite receiver indoor unit (IDU).

COAX CABLE

The coax cable must be capable of passing (950mhz - 1450mhz) with the minimum of loss. RG6 is normally used on runs up to 100ft or 30m.

LINE AMPLIFIER

Giving An Extra 20DB of gain on a long cable run the line amplifier replaces any lost signal.

SATELLITE RECEIVER

The satellite receiver operates in a similar manner to an FM tuner. It provides the user with controls to tune the various channels and also the audio which also varies.

1. Transponder tuning dial from 1 - 24
2. Audio subcarrier dial from 8mhz to 27mhz
3. bandwidth adjustment from 8mhz - 27mhz
4. Audio bandwidth from 15khz - 240khz (For use with full & half Transponder formats)
5. For narrow audio signals from 5mhz - 8mhz
6. Video audio/outputs
7. RF modulator output (3-4 VHF or UHF 30-39)

CHROMA CONVERTER

Unfortunately there is no one world standard for colour signals, and because of the international nature of satellite transmissions, the colour standard from the country of origin is used.

The major transmission types are:

- (A) PAL 4.43 as [UK] [NZ] [Australia] [India]
- (B) NTSC 3.58 as [Japan] [USA] [Canada]
- (C) Secam V - H as [USSR] [France]

(B) and (C) must be converted to a PAL signal which is suitable for NZ televisions.

VIDIPLER

Some of the downlinks to the networks such as TCN - 9 ATN - 7, TEN Australia, use two encoded signals at once. These multiple signals are separated by the vidipler unit.

POSITIONER

Because of the inclined orbit of some satellites, this unit provides N-S power to the ram in order to adjust the dish position up and down.

ELEVATION KIT AND RAM

The elevation kit and ram are guided by the positioner to adjust the dish N-S to track the moving satellite.



QUESTIONS AND ANSWERS

FREQUENTLY ASKED QUESTIONS RELATING TO SATELLITE TV

HOW LARGE A DISH WILL I NEED?

This depends on where you live and the quality of reception you require.
In NZ normally a 3m to 3.7m dish for C Band reception should suffice.

HOW ABOUT Ku BAND RECEPTION?

On the high power AUSSAT signals for NZ., 60cm - 90cm
For PAN-AM-SAT Aust./NZ reception for NZ., 1.2m - 1.8m
However, it will depend on the strength of the Ku signals when they become available here.

HOW FAR AWAY FROM MY HOUSE COULD THE DISH INSTALLATION BE?

Up to 30m (100ft) without line amplification.

HOW MANY HOMES CAN USE ONE DISH?

Up to four by way of a splitter with D.C. passing if they are not too far apart.

CAN I PAINT MY DISH?

No, as paint is a light dispersant.

HOW LONG DO SATELLITES LAST?

The latest generation satellites last up to 15 years.

WHAT IS THE PROBABILITY OF LIGHTNING STRIKING MY DISH?

The probability of a lightning strike is about the same as lightning striking a roof top television antennae.

CAN I RECEIVE MORE THAN ONE SATELLITE?

Yes with a E-W ram and positioner the dish can be made to track the CLARKE Belt.

WILL MY TV WORK WITH THE DISH?

Yes only PAL transmissions will be in colour unless you have a multi-standard TV or Chroma Converter.

IS THE INSTALLATION OF A SATELLITE SYSTEM LEGAL?

Yes, since 1984, when the Government declared Satellite TV legal, however you must comply with all your local By Laws and requirements.

It's Sat Time!

SATELLITES SERVING THE PACIFIC RIM

The twenty satellites featured on the previous page service the Nations on the Pacific Rim.

INTELSAT 174° 177° 180° 183°

A 103 member, this world wide consortium has four satellites in their Pacific cluster or (POR) as well as satellites over the Indian (IOR) and Atlantic Ocean region (AOR), serving telecommunications and international and domestic leases.

AUSSAT 156° 160° 164°

Aussat has three spacecraft in a cluster serving Australia. These satellites provide Telephony, Telecommunications, and Television throughout Australia.

INTERSPUTNIK 96.5° 116° 140° 145°

Goizont, Raduga craft are positioned where access to the Soviet Far East, and Soviet aligned countries can be served. Since early 1992 leases have been available to anybody.

PALAPA 108° 113° 118° 134°

The name given to Indonesia's regional satellite network, providing services including Telecommunications and Television to Asian Countries within the coverage area.

RIMSAT 130° 134° 142° 170°

A private satellite system using Soviet spacecraft serving Asia and the Pacific acting as a regional satellite broker.

ASIASAT 105° E

PANAMSAT2 169°

Provides services from U.S. to the Pacific Rim Nations and around the Pacific Rim.

So there are twenty different satellites covering the Pacific, via global beam or countries on spot beams.

SATELLITE DOWNLINK BEAM (Footprints)

The twenty or so satellites shown have downlinks normally in the 3.6 to 4.2GHz range. Each can have several different beam patterns or footprints with varying signal strength.

INTELSAT, RIMSAT, PALAPA, AUSSAT and PANAMSAT all show global hemispheric zone and spot beams.

PROGRAMMING

INTELSAT F508 180° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
(11) (1)	West Hemi	3.725	ESPN	27	26.27	B-MAC
(11) (3)	West Hemi	3.765	LA-TEN	28	28+	6.6MHZ
(12) (7)	West Hemi	3.845	CNNI	36	29	6.65MHZ
(13) (9)	West Hemi	3.878	LA-7	18	21	5.59+5.73MHZ
(13) (10)	West Hemi	3.898	IDB	18	21	6.6MHZ
(13) (12)	West Hemi	3.931	LA-9	20	23	6.65MHZ
(14) (14)	West Hemi	3.973	Worldnet	36	26+	6.65+7.02MHZ
(34) (13)	Global	4.015	NHK	36	27	6.6+7.02MHZ
(35) (18)	Global	4.045	RFO Tahiti	36	27	6.65MHZ
(38) (22)	Global	4.055	Nine Sydney	36	26+	6.65MHZ
(38) (24)	Global	4.187	TVNZ	36	26+	6.65MHZ

INTELSAT F511 183° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
(37) (22)	Global	4.185	AFRTS	36	26+	6.6M B-MAC
(38) (24)	Global	4.187	OCC. USE	36/18	18-26	6.6MHZ

INTELSAT F701 174° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
(38) (23)	Global	4.166	OCC. USE	20	23	6.65MHZ
(38) (24)	Global	4.187	OCC. USE	20	23	6.65MHZ

RIMSAT (3) 170° E (Not known at this time).

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio

PANAMSAT2 169° E (Not known at this time).

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio

OPTUS A3 164° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
06	S / West	V12.597	OCC. USE	20	32-34	6.6MHZ
08	S / West	V12.725	OCC. USE	27	34+	6.6MHZ
04	S / West	V12.469	OCC. USE	36	38+	6.6MHZ

OPTUS B1 160° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
1	V Spot	12.281	NA/SE/NZ	54	50+	7.38 / 7.56
2	V Spot	12.344	NA/SE/NZ	54	50+	7.38 / 7.56
3	V Spot	12394.1	NA/SE/NZ	27	45+	7.38 / 7.56
3	V Spot	12420.1	NA 7NET	27	43	7.38 / 7.56
4	V Spot	12456.1	NA OCC.	27	43	7.38 / 7.56
4	V Spot	12482.7	NA 10NET	27	43	7.38 / 7.56
5	V Spot	12535.3	SE SBS	27	43	B-MAC
6	V Spot	12565.0	SE NZ FM2	27	43	TAB RACING
7	V Spot	12.596	SE ABC	54	50+	B-MAC
8	V Spot	12725.0	SKY NA	27	43	B-MAC
9	H Spot	12313.2	NB-HP	54	50+	SCPC
10	H Spot	12375	NB-HP	54	50+	OCC
11	H Spot	12438.4	NE SBS	54	50+	B-MAC
12	H Spot	12.488	NB-9	27	43	E-PAL
12	H Spot	12514.0	NB FREE	27	43	---
13	H Spot	12550	NB	27	43	E-PAL
13	H Spot	12576.6	NB ABC	54	50+	RADIO
14	H Spot	12626.2	NE ABC	54	50+	B-MAC
15	H Spot	12688.8	NE QSTV	54	50+	B-MAC

OPTUS A2 156° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
1	V NA Spot	12.277	OPTUS	36	38	6.6 / 6.65
2	V WA Spot	12.341	OPTUS	36	38	6.6 / 6.65
3	V Se/Na Spot	12.405	OCC	36	38	6.6 / 6.65
5	V SE Spot	12.533	ED PROG	36	44	6.6MHZ
7	V WA Spot	12.661	RCTS	27	50	B-MAC
8	V WA Spot	12.725	ABC	27	50	B-MAC
12	H CA Spot	12.301	ABC	27	50	B-MAC
14	H CA Spot	12.624	RCTS	27	50	B-MAC
15	H CA Spot	12.693	ABC	27	50	B-MAC

STATSIONER 7 140° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
6 (1)	R/H Spot NH	3.675	ORBITAL	36	44dbw NH	7.0 MHZ
6 (1)	R/H Spot NH	3.675	Radio Mayak	36	44dbw NH	7.5 MHZ
(7) 2	R/H Global	3.725	Muslim TV	36	29 NZ	7.0 MHZ
10 (9)	R/H Zone	3.825	DUBL 2	36	29 NH	7.0 MHZ
10 (9)	R/H Zone	3.825	Rad Moscow	36	29 NH	7.5 MHZ

TONGA STAR 2 130° E Gorizont 29

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
6 (1)	R/H Global	3.725	TAMIL TV	36	29 NZ	7.0MHZ

RIMSAT EXPRESS 142° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
1 (6)	ZONE	3.675	ATN	36	20	7.0 + 7.5
2 (7)	ZONE	3.725	ATN	36	19-20	7.0 + 7.5
3 (8)	GLOBAL	3.775	TESTS	36	26-27	7.0 MHZ

PALAPA PACIFIC B1 134° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
20	H SPOT	4.100	SUN TV	36	36-18	6.8MHZ
21	V SPOT	4.120	MUSIC	36	36-19	6.8MHZ

PALAPA B4 118° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
6	V SPOT	3.810	BBTV	36	36-18	6.6MHZ
14	V SPOT	3.890	EMTV	36	30-15	6.2MHZ
14	V SPOT	3.980	Army TV	36	30-15	6.6MHZ

PALAPA B2R 113° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
2	H Spot	3.800	RCTI	36	34/16-18	6.6MHZ
6	V Spot	3.820	TV3	36	34/16-18	6.6MHZ
8	V Spot	3.860	RFO	36	34/16-18	6.6MHZ
9	H Spot	3.880	ABC	36	34/16-18	6.6MHZ
10	V Spot	3.900	TV1 MAL	36	34/16-18	6.8MHZ
12	V Spot	3.930	TBT11	36	36/16-18	6.6MHZ
13	H Spot	3.960	ABS-CBN	36	36/16-18	6.6MHZ
14	V Spot	3.980	CNNI	36	36/16-18	6.8MHZ
15	H Spot	4.000	HBO ASIA	36	36/16-18	B-MAC
16	V Spot	4.020	AN-TVE	36	36/16-18	6.8MHZ
17	H Spot	4.030	KBP PHIL.	20	30/12-14	6.8MHZ
17	H Spot	4.050	GMA 11	18	30/12-14	6.8MHZ
19	H Spot	4.080	TPI INO	36	36/16-18	6.8MHZ
20	V Spot	4.100	ESPN I	36	36/16-18	B-MAC
21	H Spot	4.120	SCTV	36	36/16-18	6.6MHZ
22	V Spot	4.140	NINE AUST.	36	36/16-18	6.6MHZ

PALAPA B2R 108° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
8	H SPOT	3.860	TVR1	36	36-19	6.6MHZ
10	H SPOT	3.900	OCC.	36	36-19	6.5MHZ

It's Sat Time!

STATSIONER 21 103° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
(1) 6	SPOT	3.675	SOVIET TV	36	46-18	6.6MHZ
2 (7)	GLOBAL	3.726	Muslim	36	29-28	6.6MHZ
3 (8)	GLOBAL	3.876	ASIA / NET	36	29-28	7.0MHZ

STATSIONAR 14 96.5° E

Transponder	Beam Pattern	Frequency	Programs	B/W	EIR P/NZ	Audio
(1) 6	GLOBAL	3.675	SOVIET TV	36	38-32	7.0+7.5Mhz
(1) 6	GLOBAL	3.675	Soviet Radio		38-32	7.5MHZ
9	GLOBAL	3.825	Chinese TV		27-24	7.0MHZ
	GLOBAL	3.876	Azerbaijan		27-24	7.4MHZ

SYSTEMS ON DISPLAY

C BANDS

1. 3.7M ORBITRON 20° LNB FEED HORN. WR3000

Will give excellent results on;

F508 180° on all feeds.

F511 174° on 23-24

F701 174° on 23-24

PANAMSAT 169° on Pacific Rim Beams and Oceana Beam

STAT 7 140° on Muslim TV

RIMSAT 134° on Tamil TV

STAT 21 103° on Asia NET

STAT 14 96.5° on Soviet TV
CCTV Chinese

Pictures weak but watchable

RIMSAT EXPRESS 142.5°

(1) ASIA TELEVISION NETWORK

(2) ASIA TELEVISION NETWORK

PALAPA PACIFIC 134°

(1) SUN TV (now encrypted)

(2) MUSIC TV (now encrypted)

THE FOLLOWING TRANSPONDERS COULD BE WEAK

PALAPA B2R 118° E

PALAPA B2P 113° E

PALAPA B4 134° E

PALAPA B2R 108° E

STAT 21 103° E

2. 3M ORBITRON 20° LNB FEED HORN. WR3000

Excellent Results On;

F508 CNN I

LA TEN

WORLDNET

NINE SYDNEY

TVNZ

TAHITI

lower but watchable quality for the rest

F511 174° E 23-24

F701 174° E 23-24 watchable

It's Sat Time!

PANAMSAT PACIFIC RIM	good
STAT 7 140° E Muslim TV	good
RIMSAT 134° E Tamil TV	good
STAT 103° E Asia NET	good
STAT 14 96.5 Soviet TV	good

RIMSAT EXPRESS watchable

OTHER NOT KNOWN
COULD GET SOMETHING

WHILST ALL THESE CHANNELS CAN BE RECEIVED ON A 3M - 3.7M EARTH STATION
USING THRESHOLD EXTENSION (TED) CIRCUITS THE THRESHOLD IS REDUCED FROM 8 -7 dB TO AROUND 4 DB GIVING BETTER RESULTS ON VERY WEAK SIGNALS GIVING A TRUE DXING CAPABILITY.

KU BAND

1.8M ANTENNA .6LNB WR3000S

ALL PANAMSAT AUST/NZ BEAMS
VERY GOOD

OPTUS
NZ HP BEAM 60-90CM GOOD QUALITY
NA/NZ SPLIT BEAM 1.2-1.8CM GOOD QUALITY

PANAMSAT 90CM - Reception Unknown At Present

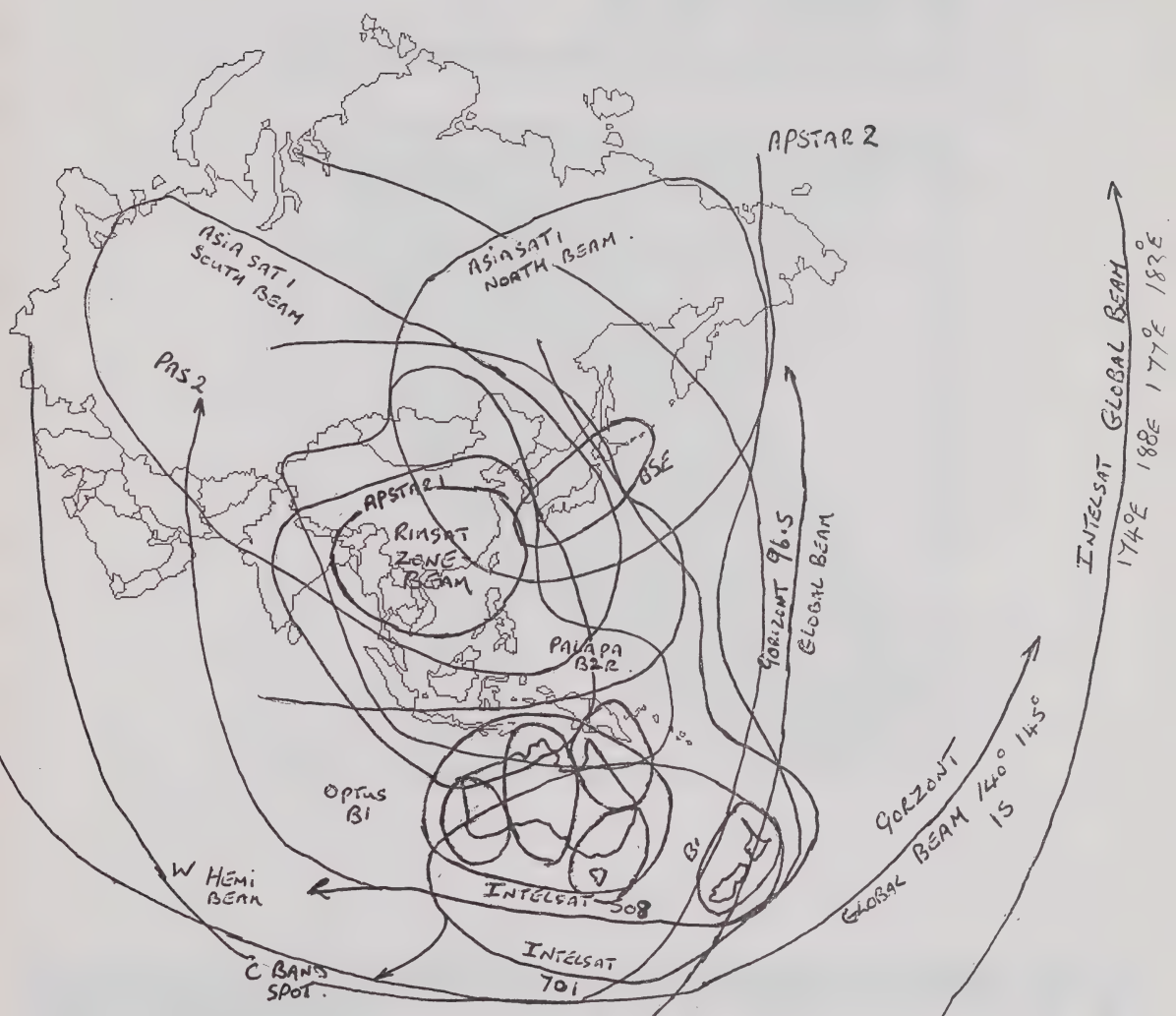
TRENDS EARLY 1995

- | | | |
|---------------|------------------|-------------|
| 1. ASIA SAT 2 | 34 DBW TO NZ | 24 CHANNELS |
| 2. PALAPA C1 | 35-36 DBW TO NZ | 24 CHANNELS |
| 3. RIMSAT (3) | 38-46 DBW TO NZ | ?? |
| 4. APSTAR (2) | 34-33 DBW TO NZ | 24 CHANNELS |
| 5. JSAT 3 | KU -C BAND TO NZ | ?? |

BY MID 1995 NZ COULD ACCESS UP TO 70 FULL TIME 24 TELEVISION CHANNELS ON A 2M - 3M EARTH STATION

It's Sat Time!

SATELLITE BEAM PATTERNS OVER ASIA and the PACIFIC



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ORBITRON

the SX



Versatility

ORBITRON

DEVELOPMENT OF SATELLITES FOR DISTRIBUTION FOR BROADCASTING.

Technological advances in broadcasting over the last few years have caused a worldwide increase in television services carried by Satellites.

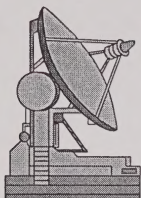
With this rapidly growing technology, many Broadcasters are now receiving overseas programming for redistribution purposes. They have in common with the Domestic Earth Station owner a need to receive quality video / audio. In the case of a Broadcaster / Narrowcaster the grade of video / audio received has to be within a range of 50 dB -S/N Ratio upwards. A lesser quality video S/N (signal to noise) levels may be acceptable for Apartment buildings, Hotels, Motels still S/N noise ratio's of high 46 dB's should be achieved.

Since the minimum S/N for rebroadcasting has been set by many broadcasters as 47 dB S/N and given the higher output signal levels now transmitted by the latest generation of Pacific Rim Satellites, TISCO is very well placed to assist a new generation of Broadcaster / Narrowcaster receive quality signals. For example, we use the signal from PAS-2 (Pan-Am-Sat) 169° within the Pacific Rim Beam pattern NZ receives a signals level of 29 - 31 Dbw full bandwidth or 23 - 24 using half transponder format. Dish sizes ranging from 4m to 9m would provide a suitable S/N ratio for rebroadcast purposes.

For narrowcasters that can use a lower signal, a much smaller antennae size can be used. For C Band rebroadcast operation, earth station diameters range from 10-18m. These standard A Intelsat earth stations are capable of providing a 50db S/N Ratio on half transponder global beams, with approximately 19-20dbw EIRP. Full transponder hemi or zone domestic standard Z earth stations 4.5m - 6m are capable of 47+ dB S/N Ratios.

Ku band Spot Beam operation with EIRP's of 45-50dbw require 3m to 4.5m earth stations to achieve a 47+ dB S/N Ratio. Depending on the incoming service, it's carrier i.e. Intelsat, Rimsat, WSR, all these Satellites would have to be tracked N/S over a 24hr period of time. Other Satellites, (Pan-Am-Sat, Pas2) Optus, Rimsat express do not require to be tracked.

However depending on the requirement TISCO is capable of providing a suitable solution for the new breed of Broadcaster/Narrowcaster.



ITS SAT TIME!

ENQUIRY SHEET

THANK YOU FOR YOUR ENQUIRY.

PLEASE ENTER DETAILS BELOW

CUSTOMER NAME

COMPANY

CONTACT ADDRESS

ADDRESS 2

ADDRESS 3

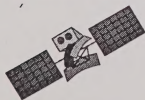
PHONE

FAX

REQUIREMENTS- COMMERCIAL OR
INDUSTRIAL

ANY SPECIFIC PROGRAM
REQUIREMENTS

OTHERS



ELECTRONIC COMPONENTS LTD

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